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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/148,723 09/03/98 FARNWORTH

W MI22-981

021567 QM22/0227
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EXAMINER

TUGRANG, D

ART UNIT

PAPER NUMBER

3729

DATE MAILED:

02/27/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/148,723

Applicant(s)
Farnworth et al

Examiner
A. Dexter Tugbang

Group Art Unit
3729



☒ Responsive to communication(s) filed on Dec 18, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-3, 6, 8, 11-13, 20, 22, 23, 26, 27, 30, 31, 36, 37, and 45-47 is/are pending in the application.

Of the above, claim(s) 12, 46, and 47 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-3, 6, 8, 11, 13, 20, 22, 23, 26, 27, 30, 31, 36, 37, and 45 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 18

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Response to Amendment

1. The Applicants' amendment in Paper No. 17 (filed 12/18/00) has been fully considered and made of record.

Election/Restriction

2. Pending Claims 46 and 47 are drawn to Species D, Figure 4, with regards to the embodiment of features of "fluxless bonding" (described in the Applicant's specification at page 6, lines 1-9). Claims 46 and 47 are independent and distinct for the reasons set forth in Paper No. 5, dated 9/23/99, Paragraph No. 5.

Since Applicant has received an action on the merits for the originally presented invention of Species F, drawn to Figure 6, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, Claim 46 and 47 have been withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

3. Claim 12 is additionally withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to the nonelected invention of Species D, Figure 4, there being no allowable generic or linking claim.

4. Applicant's election of Species F, Figure 6 by original presentation *with traverse* in Paper No. 17 is acknowledged. The traversal is on the ground(s) that Claims 12, 46 and 47 are

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associated with Figure 6. This is not found persuasive because what makes each of these Claims a distinct and independent invention is the claimed feature of "fluxless bonding". This feature is clearly disclosed by the Applicant in the specification (page 6, lines 1-9) as being drawn to Figure 4, Species D, which is the nonelected invention. Although in the Restriction Requirement of Paper No. 5, the Examiner thanks the Applicants for correctly pointing out that Claim 12 was mentioned as being generic. However, this is considered a typographical error and subsequently, Claim 12 was properly regrouped with the non-elected invention of Species D, Figure 4.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 6, 8, 11, 13, 20, 22, 23, 26, 27, 30, 31, 36, 37 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Trabucco 5,899,737 in view of Sakemi et al 5,655,704.

Trabucco discloses the claimed bonding process comprising: contemporaneously retaining at least two balls of solder 24 over a substrate 10; exposing and melting the balls of solder with a fixed laser 32, 34 to effect bonding; providing a frame (masking plate 18) which moves relative to the laser via transport belt 14 and also contains individual holes 22 to register alignment of the balls of solder with the substrate; delivering the balls of solder over the frame with a vacuum

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fixture 28 and pickup head 26 which additionally retains the balls of solder in an ambient processing environment (see sequence of Fig. 1); and removing the frame with pickup element 36. The “individual” or “associated bond pads” is interpreted as the contact pads discussed at col. 3, lines 47-49.

Trabucco does not teach the step of dipping a substrate into a volume of solder balls.

Sakemi teaches the act of dipping a substrate into a volume of multiple solder balls to at least properly position the solder balls on the substrate as well as place individual solder balls in respective pads of the substrate (see Fig. 4). The act of “dipping” is broadly read as *placement* of the substrate within multiple balls of solder to place solder balls on the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Trabucco by alternatively dipping the substrate in the balls of solder, as taught by Sakemi, to accomplish the same purpose and functions of positioning and placing the solder balls on the substrate for bonding.

Response to Arguments

7. Applicant's arguments have been considered to met and inclusive in view of the new ground(s) of rejection set forth above.

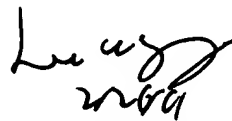
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Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dexter Tugbang whose telephone number is (703) 308-7599.


LEE YOUNG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

ADT

February 26, 2001